

af ~~thereof lower rotational friction. This improved structure has achieved lower friction, lower noise, lower power consumption, longer life and higher speed.~~

ABSTRACT

An improved rotation-support structure for heat-dissipation fans comprising of precision molded and processed ceramic tubes, axle shafts, and bearings; for example, a ceramic tube-bearing attached to the fan-rotor along with a flanged ceramic axle shaft which passes through the ceramic tube-bearing and is secured with a retaining device; for example, a gapped retaining ring. The inner and outer surfaces of these ceramic components are processed to either: 1) provide better bonding surfaces with the fan-rotor or 2) to reduce contact surfaces between two ceramic components, thereof reducing rotational friction. This improved structure has achieved lower friction, lower noise and vibration, higher efficiency and extended life and operational speeds than conventional units.